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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,719

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EXAMINER

MCCULLEY, MEGAN CASSANDRA

ART UNIT

PAPER NUMBER

1796

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/566,719	<b>Applicant(s)</b> OHBAYASHI ET AL.	
	<b>Examiner</b> Megan McCulley	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 21-23, 27, and 30-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Haraguchi et al. (WO 03/037985). Citations made to the WIPO document refer to the English language equivalent (US 2004/0254328).

Regarding claims 21, 22: Haraguchi et al. teach a method comprising reacting an aliphatic polyamine based compound/reaction product of an aliphatic polyamine and an epoxy with a boric acid ethyl ester (example 1). The reaction product of a polyamine and an epoxy has at least one of an amino group. The boric acid ethyl ester is of the formula (1) where n is 1 and R is C<sub>2</sub>H<sub>5</sub>. Since in example 1, 100g of a bisphenol type epoxy (2 epoxy groups in the molecule) with an epoxy equivalent of 190 g/eq is reacted with 32.4 g of an aliphatic polyamine with 77g/eq, about 20 grams of unreacted bisphenol epoxy is present if all of the amine groups are reacted. Therefore, free bisphenol epoxy is still present. The composition is then mixed/stirred (para. 86) in an organic solvent/tetrahydrofuran.

Regarding claim 23: Haraguchi et al. teaches removing the organic solvent (para. 15).

Regarding claim 27: The components of the composition are dissolved in a solvent including lower alcohols (para. 50).

Regarding claim 30: Haraguchi et al. teaches a method comprising heating while avoiding gel formation (para. 58).

Regarding claim 31: A cured product/article is taught by Haraguchi et al. of the composition cured with compression molding under heat (para. 66).

Regarding claim 32: Haraguchi et al. teaches a method for producing a heat-resistant laminate sheet, which comprises: providing an uncured coating film layer of the epoxy resin composition on the surface of a heat-resistant substrate sheet; laying/layering another heat-resistant substrate sheet on the uncured coating film layer; and curing the uncured coating film layer with thermocompression bonding/thermal contact bonding (para. 17).

Regarding claim 33: The heat-resistant laminate sheet can be copper (para. 62).

Claims 34 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Haraguchi et al. (WO 03/037985). Citations made to the WIPO document refer to the English language equivalent (US 2004/0254328).

Regarding claims 34-35: Haraguchi et al. teach a method comprising reacting a polyamine based compound/reaction product of an aliphatic polyamine and an epoxy with a boric acid ethyl ester (para. 16, example 1). The reaction product of a polyamine and an epoxy has at least one of an amino group. The boric acid ethyl ester is of the formula (1) where n is 1 and R is C<sub>2</sub>H<sub>5</sub>. Since in example 1, 100g of a bisphenol type

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epoxy (2 epoxy groups in the molecule) with an epoxy equivalent of 190 g/eq is reacted with 32.4 g of an aliphatic polyamine with 77g/eq, about 20 grams of unreacted bisphenol epoxy is present if all of the amine groups are reacted. Therefore, free bisphenol epoxy is still present. The composition is then mixed/stirred (para. 86) in an organic solvent/tetrahydrofuran.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haraguchi et al. (WO 03/037985). Citations made to the WIPO document refer to the English language equivalent (US 2004/0254328).

Regarding claim 24: Haraguchi et al. teaches the basic claimed composition as set forth above. While the ratio of the content of the nitrogen-containing group of the polyamine compound to the content of boron of the boric acid compound is not taught, the experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. See *In re Aller*, 105 USPQ 233 and MPEP 2144.05. At the time of the invention a person having ordinary skill in the art would have found it obvious to optimize the ratio of nitrogen to boron and would have been motivated to do so for such desirable properties as effective flame retardancy and reactivity with epoxy groups. A

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prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. See *In re Boesch and Slaney*, 205 USPQ 215.

Regarding claim 26: Haraguchi et al. teaches the basic claimed composition as set forth above. While the amount of polyamine borate is not taught, this is a result-effective variable which can be optimized. At the time of the invention a person having ordinary skill in the art would have found it obvious to optimize the amount of polyamine borate in the composition and would have been motivated to do so for such desirable properties as fast curing without effecting the properties of the resin as well as increased flame retardancy.

Claims 25 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haraguchi et al. (WO 03/037985) as applied to claim 21 above and in view of Kawachi et al. (JP 09-157498). The English language machine translation of the Japanese document is used for the citations below.

Regarding claim 25: Haraguchi et al. teaches the basic claimed method as set forth above. Not disclosed is the content of the polyamine borate in regards to the epoxy. However, Kawachi et al. teaches 70 parts epoxy resin, 30 parts imidazole/amine (which has 2 amino groups) and 20 parts tributyl borate ester (pg. 11 para. 61). Therefore the borate ester is the limiting reagent so there is 28 parts polyamine borate to 100 parts epoxy. Haraguchi et al. and Kawachi et al. are analogous art since they are both concerned with the same field of endeavor, namely epoxy resins cured with

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polyamine borates. At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the ratio of Kawachi et al. with the method of Haraguchi et al. and would have been motivated to do so for such desirable properties as to control the glass transition temperature.

Regarding claims 28 and 29: Haraguchi et al. does not teach the additional curing agent. However, Kawachi et al. teaches a similar composition comprising an additional curing agent such as dicyandiamide (para. 28). At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the additional curing agent taught in Kawachi et al. with the method of Haraguchi et al. and would have been motivated to do so since Kawachi et al. discloses that the amine compound also acts as an accelerator when an additional curing agent is contained (para. 28).

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haraguchi et al. (WO 03/037985) as applied to claim 34 above. Citations made to the WIPO document refer to the English language equivalent (US 2004/0254328).

Regarding claim 36: While Haraguchi et al. uses an aliphatic polyamine in example 1, aromatic amines are also suggested as an alternative (para. 37). At the time of the invention a person having ordinary skill in the art would have recognized that Haraguchi et al. identified a finite number of predictable potential polyamines and could have made a simple substitution; that is, it would have been obvious to try an aromatic polyamine in place of an aliphatic polyamine based on the teaching of Haraguchi et al.

### ***Response to Arguments***

Applicant's arguments with respect to claims 21-36 have been considered but are moot in view of the new ground(s) of rejection. However, those still pertaining to the above rejection will be addressed below.

A) Applicant's argument that Haraguchi et al. does not first prepare the polyamine borate and then mix it with an epoxy resin is not persuasive. As set forth in the rejection above, the claim limitations are met. Since the claim language is "comprising", additional steps can be present, including pre-reacting an epoxy. The first claimed step does not require that no epoxy resin be present. Nor does it exclude water. Further, the epoxy resin is not required to be added after the polyamine borate is produced, but merely mixed. These limitation steps are disclosed in Haraguchi et al.

B) In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the excellent high glass transition temperature) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP



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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megan McCulley whose telephone number is (571)270-3292. The examiner can normally be reached on Monday - Thursday 7:30-6:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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/Mark Eashoo/  
Supervisory Patent Examiner, Art Unit 1796

/M. M./  
Examiner, Art Unit 1796